A Feasibility Study of a Virtually Delivered Memory

Rehabilitation Protocol in Older Adults

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Procedures

All sessions were completed virtually through the Zoom platform. Upon qualification, the necessary materials for the study were delivered to the participant. These materials included a personal EON-Mem manual, worksheets, blank notecards, a package of gum, a pen, and loose-leaf pages from the Repeatable Battery for Neuropsychological Status (RBANS) and Ecological Memory Simulations (EMS) assessments, which needed participant completion.

Before and after the treatment sessions, participants completed the pre- and post-assessments via Zoom. Alternate forms of the RBANS and EMS were used for the pre- and post-assessments. Surveys regarding demographics (i.e., biological sex, age, educational level), memory strategies, and depression and anxiety symptoms were completed electronically. Specifically, the Hospital Anxiety and Demographics Scale (HADS) is a valid and reliable questionnaire used to measure common depression and anxiety symptoms the participant might have experienced over the past week. The Short Form 36 (SF-36) is a reliable and valid measure used to assess health-related quality of life, as well as how these affect social and occupational activities. To assess subjective memory performance, we administer the memory strategies and complaints survey. We also used the Ecological Memory Simulations (EMS) developed by Stringer and the Repeatable Battery for Neuropsychological Status (RBANS) as measures of objective memory function and strategies. Virtual administration of RBANS correlates well with in-person administration, indicating the reliability of virtual administration. The EMS was developed to assess the areas of memory addressed by the EON-Mem program, and the RBANS is a standardized assessment of cognitive changes related to aging. Additionally, structured exit interviews were completed to determine how and if the participants felt the program was beneficial.

Participants attended a single one-on-one virtual treatment session per week, with sessions ranging between 60-90 minutes, for a total of six weeks. The treatment sessions were based on the EON-Mem treatment protocol with the permission of the author. The protocol was modified to remove the routes and appointment applications, and participants were only required to complete homework assignments relative to the topics covered accordingly.

As described above, EON-Mem strategies are based on the application of the WOPR acronym: write, organize, picture, rehearse. The treatment sessions focused on using the WOPR acronym in various day-to-day scenarios to compensate for memory impairments that participants commonly face. Therapists followed session outlines that specified what to say and do at each point in the intervention. Between treatment sessions, participants were asked to complete daily homework assignments from the manual that allowed them to practice strategies they discussed with the therapists and apply them to real-world situations. The practice between sessions was necessary in order to further solidify the applications of WOPR. At the start of each treatment session, the EON-Mem manual instructed the therapist to review the homework assignments from the previous week.

The six treatment sessions each focused on a specific aspect of memory. During the first treatment session, participants were introduced to the EON-Mem program and the WOPR approach. The therapists discussed their goals for memory improvement and how the EON-Mem program could help the participants. Participants also used WOPR to learn and remember strings of numbers. The homework for the next week allowed participants to practice applying WOPR to numbers in their daily life that they often needed to remember and recall (e.g., telephone numbers). For the second session, participants applied WOPR to remembering frequently lost object locations and focused on creating mental images to do so. Participants practiced using

mental images and WOPR to remember object locations at home. During the third and fourth

sessions, participants implemented WOPR to organize oral and written information using

organization (acronyms and acrostics) and visualization (picturing the information). Therapists

also addressed difficulties participants had with implementing WOPR and discussed strategies

for overcoming these challenges. Some of these challenges included forgetfulness and perceiving

WOPR as being too time consuming to use in their daily life. Participants used strategies for

remembering details from a short story during the fifth session. Participants were instructed to

apply WOPR to information and stories they came across during their daily life. During the sixth

and final session, participants learned to apply WOPR to biographical information about

individuals. Additionally, therapists reviewed and performed troubleshooting for applying

WOPR to information taught throughout the course.

Analysis

To address questions regarding feasibility (e.g., adherence, attrition, etc.), we calculated

descriptive statistics (i.e., count statistics, means, standard deviations, and range) on sample

information (i.e., age, years of education, etc.) and homework adherence. Differences between

pre- and post-testing for questionnaire data (e.g., HADS) were analyzed using paired samples *t*-

tests. For preliminary memory-related outcomes, we calculated reliable change indices (RCIs).

We calculated the RCIs for the EMS, RBANS subtest scores, and the RBANS delayed memory

index (combination of delayed memory subtests) using the performance outcomes from both pre-

and post-testing timepoints. In addition to the two time points, the RCI equation requires a

reliability estimate and standard deviation. We used the standard deviations calculated from a

similar study that implemented the EON-Mem study in a group format for younger and older

adults. The Everyday Memory Simulations do not include alternate form reliability estimates;

therefore, we used the internal consistency estimates calculated in the same study implementing

EON-Mem. We used internal reliability rather than test-retest reliability, as there was an active

intervention implemented between the two testing sessions, therefore invalidating the use of test-

retest reliability. For the RBANS, we used the alternate form's reliability coefficients provided

by the test's manual (see Table 1 for reliability estimates).